US006792860B2

(12) **United States Patent**
Schröder et al.

(10) **Patent No.: US 6,792,860 B2**
(45) **Date of Patent: *Sep. 21, 2004**

(54) **METHOD AND DEVICE FOR PRESSING A PACKING AGAINST A CYLINDER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/275,945**

(22) PCT Filed: **May 16, 2001**

(86) PCT No.: **PCT/DE01/01840**

§ 371 (c)(1),
(2), (4) Date: **Nov. 15, 2002**

(87) PCT Pub. No.: **WO01/87613**

PCT Pub. Date: **Nov. 22, 2001**

(65) **Prior Publication Data**

US 2003/0167951 A1 Sep. 11, 2003

(30) **Foreign Application Priority Data**

May 17, 2000 (DE) 100 24 330

(51) **Int. Cl.**[7] **B41F 13/42**; B41F 30/00; B41F 27/00

(52) **U.S. Cl.** **101/477**; 101/415.1; 101/216

(58) **Field of Search** 101/477, 415.1, 101/216, 217, 378, 382.1, 492

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,309,835	A *	5/1994	Hartung et al.	101/415.1
5,617,792	A	4/1997	Rau et al.	
6,009,801	A *	1/2000	Zuber et al.	100/35
6,725,778	B2 *	4/2004	Bitterich et al.	101/477
2003/0177926	A1 *	9/2003	Bitterich et al.	101/415.1

FOREIGN PATENT DOCUMENTS

EP	0 433 798 B1	10/1995
EP	0 712 725 A2	5/1996
EP	0 710 556 B1	12/1998
EP	0 712 725 B1	5/1999

* cited by examiner

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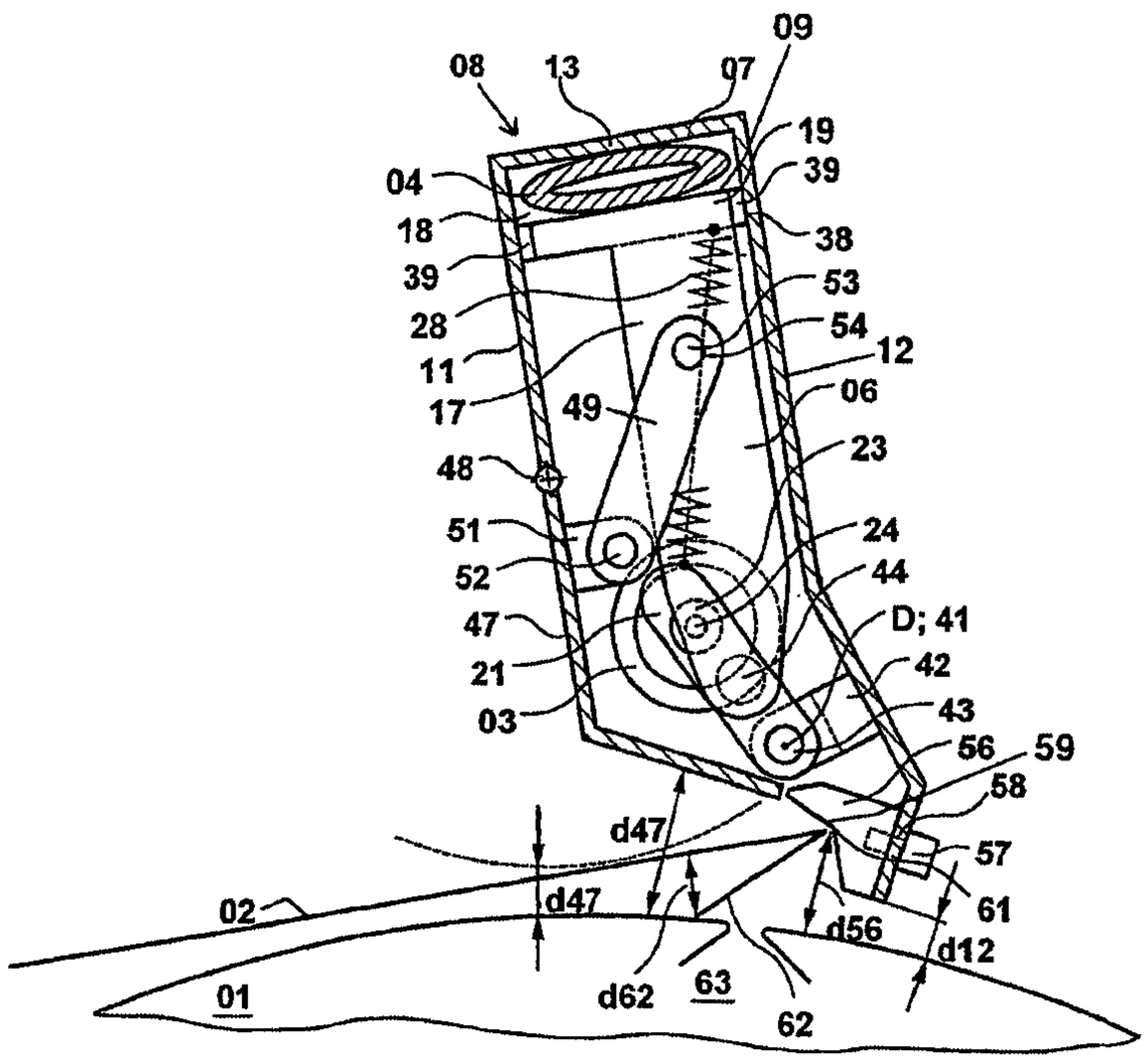
(57) **ABSTRACT**

A packing is pressed against a surface of a cylinder by using at least one roller which is deployed and retracted with respect to the cylinder by an adjusting mechanism. A guard is provided for covering the roller. The guard is actuated by the roller adjusting mechanism. The guard covers the roller in the direction of the cylinder and is actuated with the roller.

9 Claims, 4 Drawing Sheets



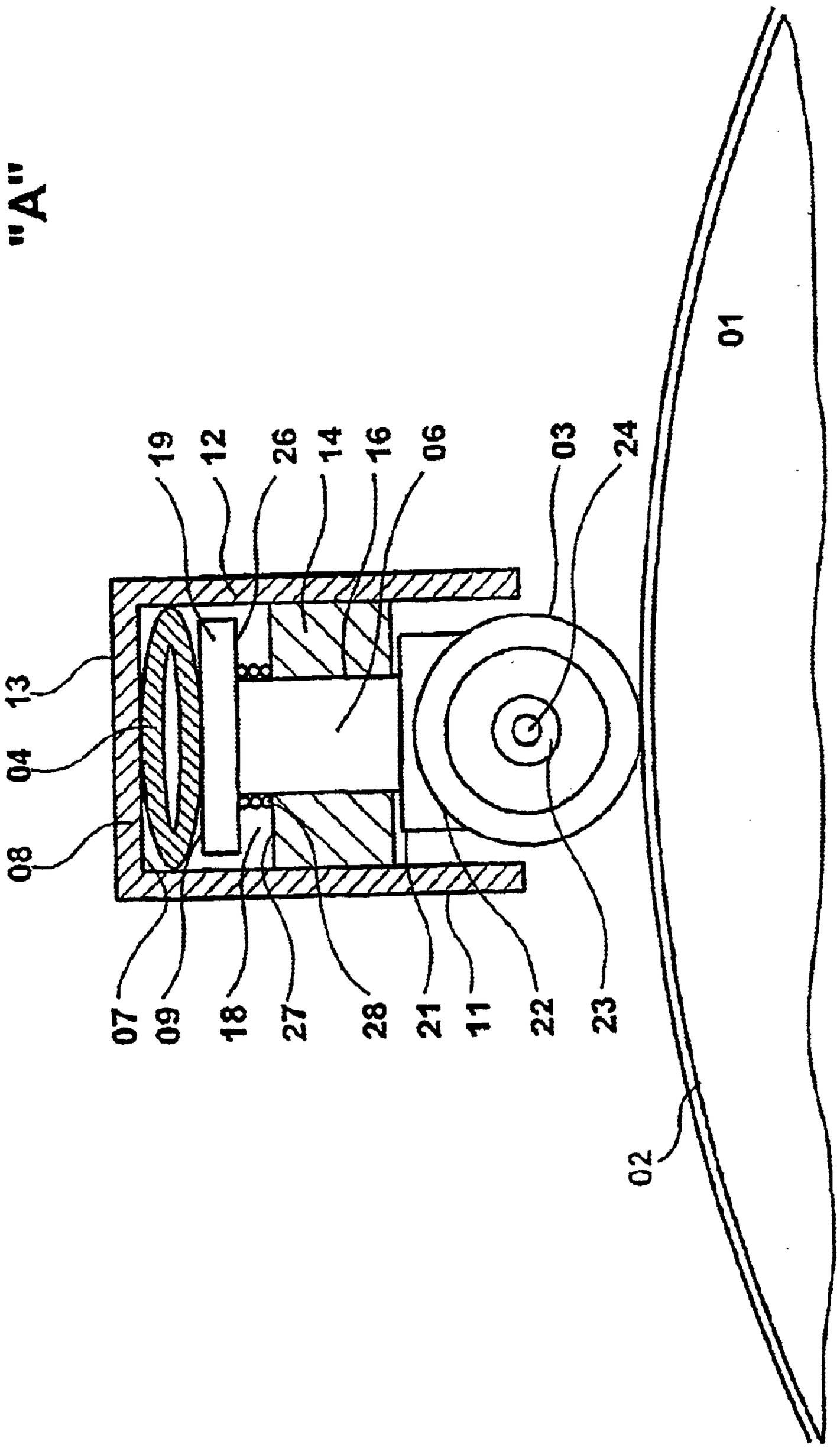


Fig. 1

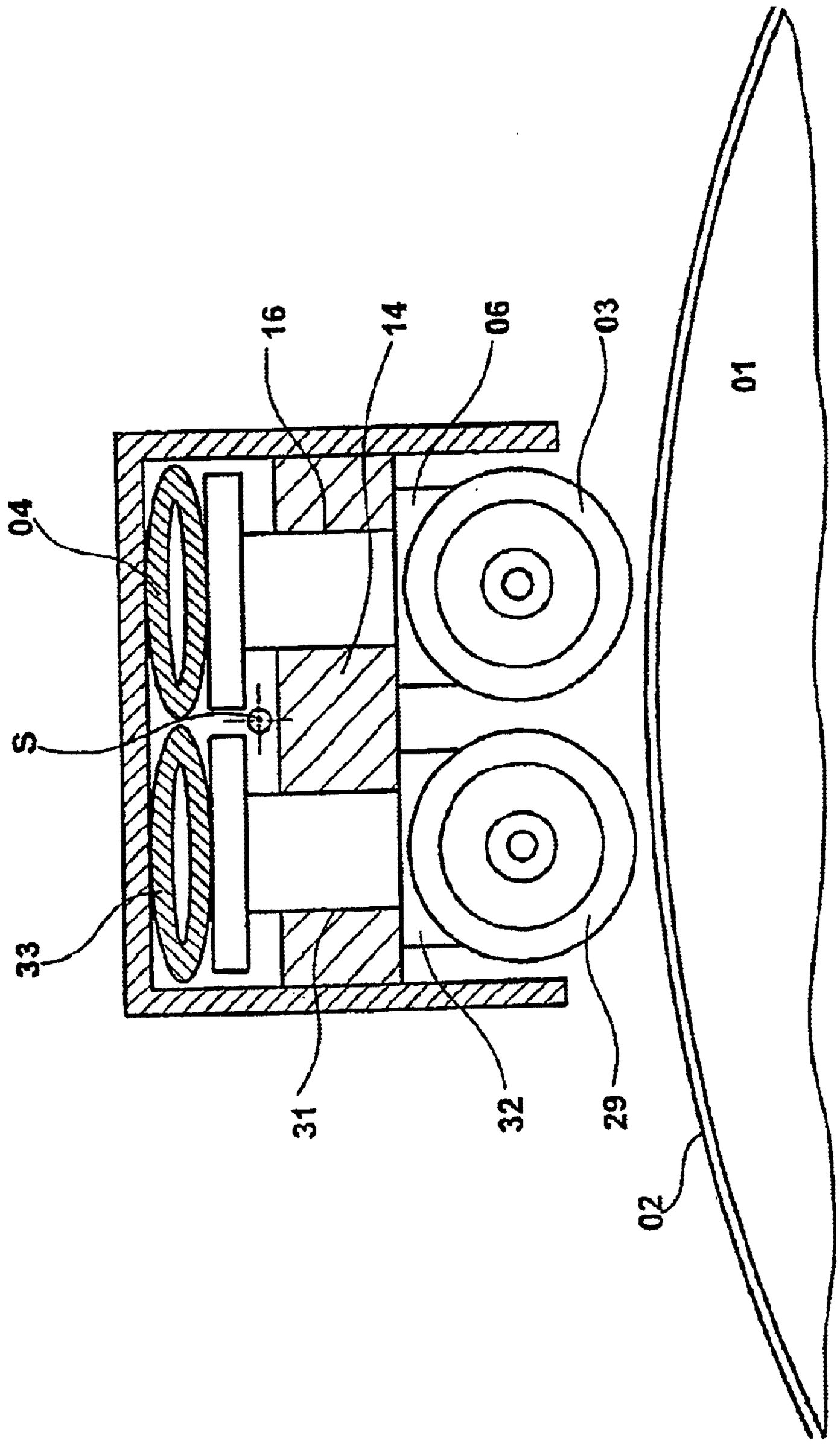


Fig. 2

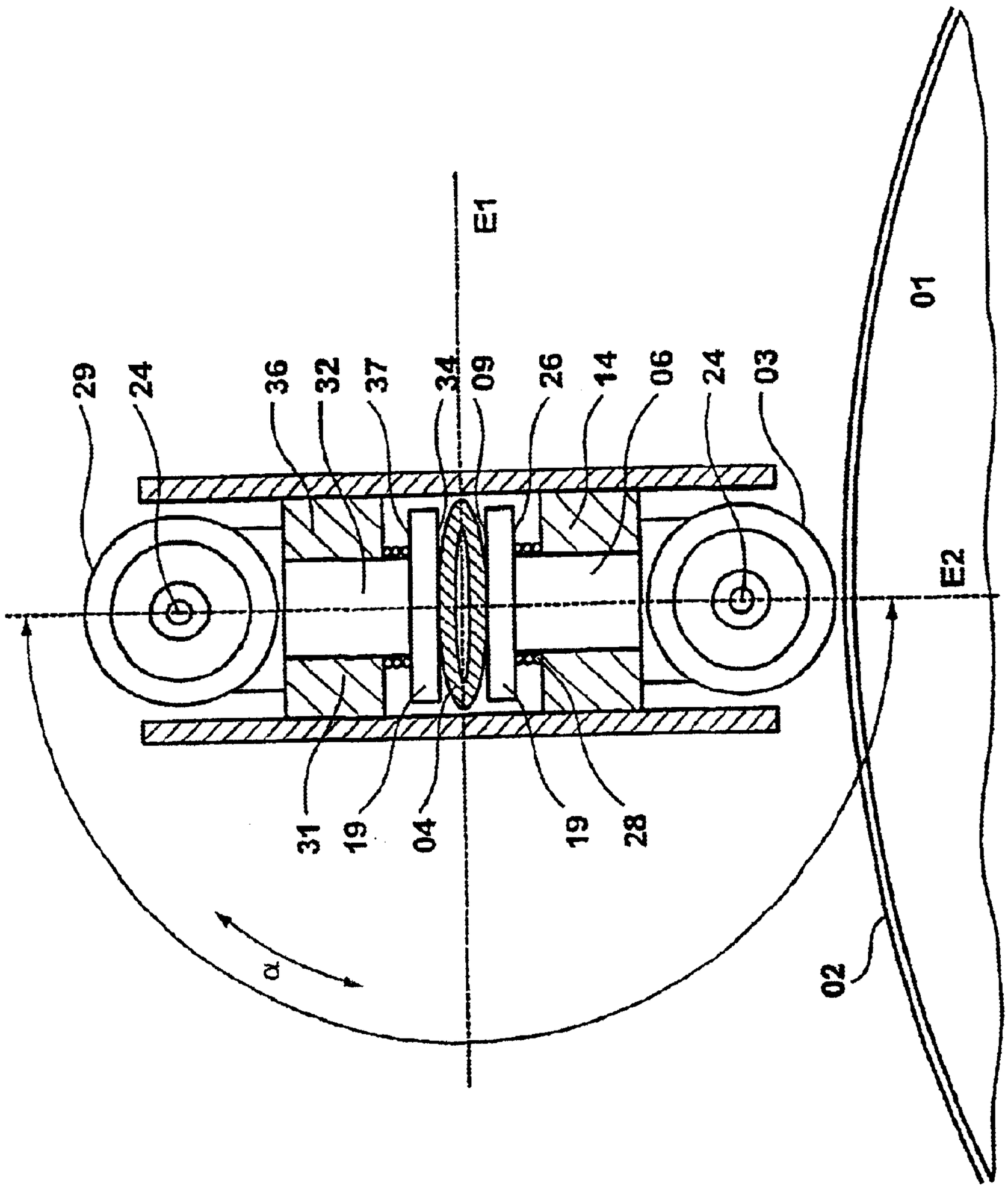
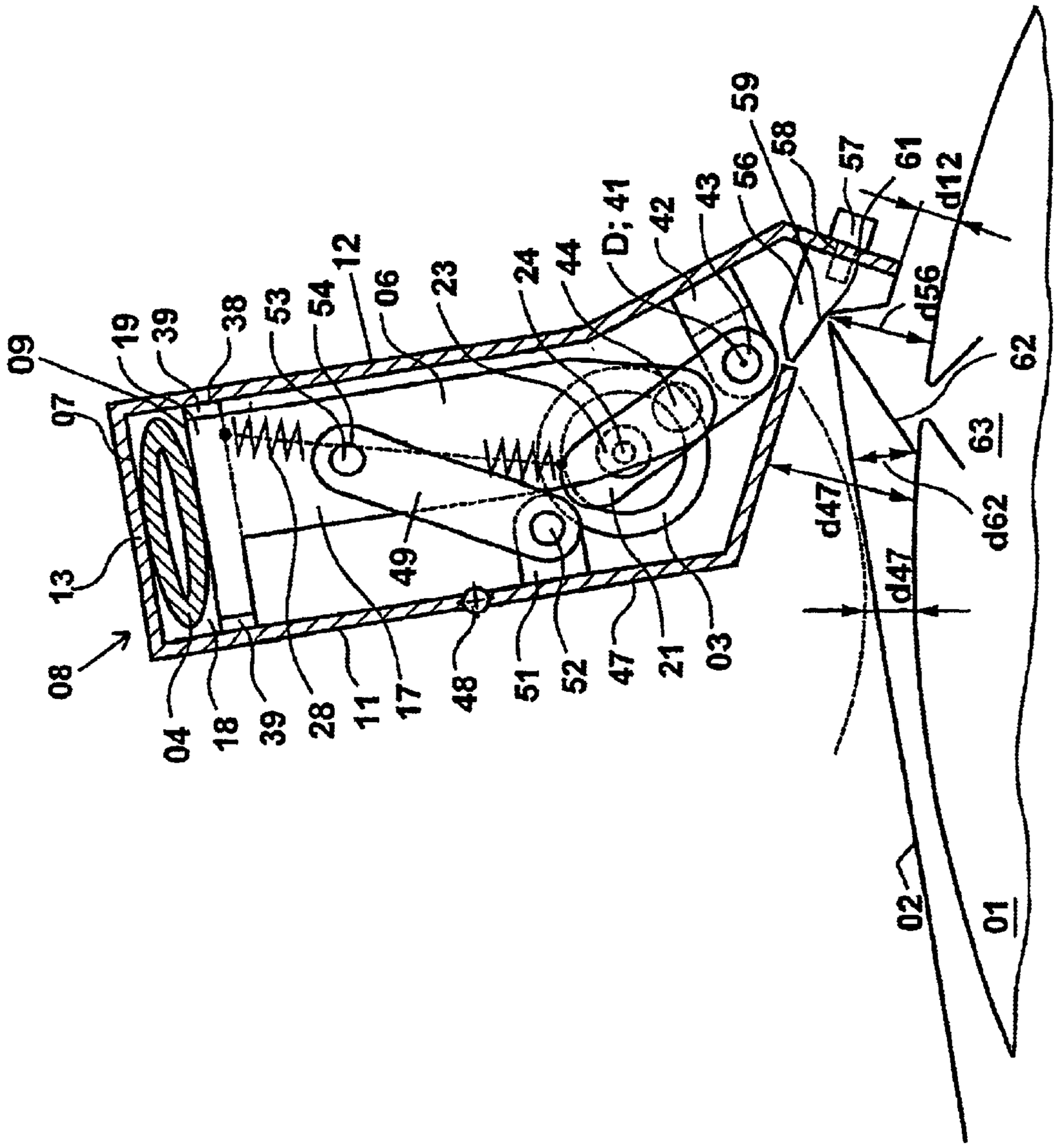


Fig. 3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03
02
01

Fig. 4

METHOD AND DEVICE FOR PRESSING A PACKING AGAINST A CYLINDER

CROSS-REFERENCE TO RELATED APPLICATIONS

The subject U.S. patent application is the U.S. national phase of PCT/DE01/01840, filed May 16, 2001; published as WO 01/87613 on Nov. 22, 2001, and claiming priority to DE 100 24 330.4 filed May 17, 2000.

FIELD OF THE INVENTION

The present invention is directed to a method and to devices for pressing a packing, a cover or a dressing against a cylinder. A roller can be deployed and retracted by an adjusting mechanism and can be covered by a guard.

BACKGROUND OF THE INVENTION

EP 07 12 725 B1 discloses a device that is usable for pressing against printing plates with the aid of a number of rollers which are disposed along the cylinder circumference. In order to protect it from getting dirty, the device is disposed in a box-shaped dirt guard that can be moved out of the deployment region of the rollers. Additional opening flaps are disposed on the dirt guard and can be actuated by separate working cylinders.

EP 04 33 798 B1 has a pivotable guard for a changing device of a printing plate, which pivotable guard protects the entire apparatus, that is oriented toward the access side, from getting dirty. The pressing roller is a one piece roller, and working cylinders situated at both ends of the roller place it against the cylinder by use of a lever.

EP 07 10 556 B1 discloses a device for guiding the trailing end of a plate into a channel during plate installation. In this connection, after the leading end of the plate has been clamped in place, and after most of the plate has been mounted in place, a feeder carriage is moved against the cylinder and guides the trailing end of the plate into the channel by the use of an insertion slider disposed on the carriage.

SUMMARY OF THE INVENTION

The object of the present invention is to produce a method and devices for pressing a packing, a cover or a dressing against a cylinder blanket.

The object is attained according to the present invention by the use of at least one roller which is deployed and retracted by an adjusting mechanism. The roller can be covered, in the direction of the cylinder, by an actuating guard. Both the guard and the roller are actuated by the same adjusting mechanism. A stop on the device that deploys and retracts the at least one roller is engageable by the leading, acutely bent end of the packing, cover dressing or plate to be applied to the cylinder. The stop is inclined toward the cylinder. At one location, the spacing between the stop and the cylinder is less than the height of the acutely bent plate end.

The advantages that can be attained with the present invention are comprised particularly in that a guard is provided for the rollers. This guard limits the possibility of the rollers getting dirty when they are in the retracted position. The rollers and the guard are actuated with the same adjusting mechanism. The movements of both the guard and rollers can therefore occur synchronously and without incurring additional control and drive costs. It is particularly advantageous to couple the movable guards to the roller supports that are moved by the adjusting mechanism.

To accomplish an exact insertion of a leading end of a packing, cover or dressing into a channel in the cylinder, at least one stop is advantageously provided, which stop is stationary in relation to the machine frame. It is advantageous that when installing the packing, cover or dressing, the formation or structure of the stop imparts an initial stress on the leading end of the packing, cover or dressing, which permits the leading end to engage, in detent fashion, in the provided clamping or tensioning device in the cylinder in a manner that is reproducible because it is guided.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention are shown in the drawings and will be described in detail below.

FIG. **1** is a cross-sectional view through a first preferred exemplary embodiment of a device for pressing against the packing, cover or dressing in accordance with the present invention and showing the device in the deployed position A;

FIG. **2** is a cross-sectional view through a second preferred embodiment of the present invention, and using first and second rollers for installation and removal of the packing, cover or dressing;

FIG. **3** is a cross-sectional view through a third preferred embodiment of the present invention, and using first and second rollers for installation and removal of the packing, cover or dressing; and

FIG. **4** is a cross-sectional view through a fourth preferred embodiment of the present invention, and with an increased stroke of the roller movement, pivoting guards for covering the rollers, and a stop for the secure insertion of the leading plate end.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A cylinder **01**, for example a forme cylinder or a transfer cylinder **01** of a rotary printing press, has a packing, cover or dressing **02**, for example a printing plate **02**, if cylinder **01** is a forme cylinder or a rubber blanket **02**, if cylinder **01** is a transfer or blanket cylinder, disposed on it during operation, as may be seen in FIG. **1**. The packing, cover, dressing or blanket **02** will be referred to as a packing hereinafter.

The device for pressing the packing **02** against the cylinder **01** is advantageously disposed so that it is stationary in relation to the cylinder **01**, and only cooperates with the cylinder **01** when actuated. In order to install the packing **02** onto the cylinder **01** or in order to remove the packing, a device for pressing against the packing **02** similar to the one depicted in FIG. **1** can also be pivoted against the cylinder **01** by the use of a device that is not described in detail here. This can, for example, be achieved by the use of pivotable lever arms, through linear motion against a threaded spindle, or with other linear drive mechanisms.

When the device for pressing against a packing **02** is in the operational state, as depicted in FIG. **1**, i.e. when changing the packing blanket **02**, the device extends with its longitudinal direction approximately parallel to an axis of rotation of the cylinder **01**. During installation or removal of the packing **02**, a number of rollers **03**, which are associated with the pressing device, are pressed against the rotating cylinder **01** by the operation of an adjusting mechanism, generally at **04**.

The packing pressing device essentially has a number of rollers **03** which are spaced apart from one another in the

longitudinal direction of the cylinder **01**, roller supports **06** that support the rollers **03**, the adjusting mechanism **04**, a support surface **07**, and possibly a frame **08**. For example, the frame **08** can be disposed, in a stationary or mobile fashion, on a machine side frame that is not specifically shown. For example, the adjusting mechanism **04** is embodied as a reversibly deformable hollow body **04**, such as, for example a hose **04**, which can be acted on with pressure fluid. The frame **08** serves to contain the roller supports **06** and the hollow body **04** and can include the support surface **07**. When acted on by pressure fluid, the hollow body **04** is caused to expand against the support surface **07** and places the roller **03** against the cylinder **01** by engageable with a surface **09** of the roller support **06** that cooperates with the deformable hollow body **04**.

In a first preferred embodiment of the device for pressing a packing against a cylinder in accordance with the present invention, the frame **08** is disposed approximately parallel to the rotation axis of the cylinder **01** in the longitudinal direction of the cylinder **01** and is configured as an approximately U-shaped crossbar **08** that has a base **13** and depending legs **11**; **12** on opposite sides of the base **13**. Between the legs **11**; **12**, and oriented away from the base **13**, there is a strip **14**. A number of guides **16** extend through the strip **14**, which guides **16** are spaced apart from one another in the longitudinal direction of the cylinder **01**. For example, each guide **16** in the strip **14** is configured as a bore or as a bore containing a sleeve or a bearing bushing and allows a strut, rod or tappet **17**, that is associated with or a part of the roller support **06** to move in a longitudinally guided fashion.

The strip **14**, together with the two depending legs **11**; **12**, and the base **13**, form a hollow chamber **18** that is extending in the longitudinal direction of the cylinder **01**. On its side oriented toward the hollow chamber **18**, the base **13** of the U-shaped cross bar has the support surface **07** that, as discussed above, cooperates with the inflatable hollow body **04**. The legs **11**; **12** can also be embodied as struts or can be omitted entirely.

The inflatable or expandable hollow body **04** is disposed in the longitudinal direction in the hollow chamber **18** between the two legs **11**; **12**, the base **13** with the support surface **07**, and the surfaces **09** of the roller supports **06** that cooperate with the hollow body **04**.

The roller support **06**, which is embodied with two arms, essentially has a head **19** which is embodied, for example as a plate **19**, and which plate **19** is disposed in the hollow chamber **18** of the frame **08**, and cooperates with the hollow body **04**. Roller support **16** also has two struts, rods, or tappets **17** that each protrude through a respective guide **16** of the strip **14** and are each provided with a foot **21**, which supports the roller **03**. The strut **17**, which may be, for example a cylindrical rod **17**, is disposed so that it can slide in respect to its longitudinal direction in the guide **16** of the strip **14**. Rod **17** connects the other components of the roller support **06** at its respective ends, namely connecting the plate **19** disposed in the hollow chamber **18** to the foot **21**, which is disposed outside the hollow chamber **18**, which foot **21** supports the roller **03**, and which is embodied, for example, in the form of a leg **21**. The cross section of the rod **17** approximately corresponds to the cross section of the guide **16** and/or to the inner diameter of a bearing bushing or a sleeve provided in the guide **16** for better axial guidance of the rod **17**.

On at least one of its side surfaces **22**, the leg **21** has a radial bearing **23**, for example a bearing bushing **23** for use in containing an axle **24** that is associated with the roller **03**. The roller **03** is disposed between the two legs **21** so that its longitudinal axis extends approximately parallel to the rotation axis of the cylinder **01** during a plate change.

At each of its ends, the roller **03** has an end of the axle **24**, which axle **24** either passes all the way through the roller **03** or is discontinuous. These axle ends each cooperate with an associated bearing bushing **23** in their associated leg **21**. The roller **03** can be a rubber roller, a plastic roller, or a different roller **03** whose running surface is provided with a soft covering that does not damage the packing **02**.

On its side oriented toward the hollow body **04**, the roller support head or plate **19** has the first surface **09** that cooperates with the deformable hollow body **04**. A second surface **26** of the plate **19**, opposite from the first surface **09**, cooperates as a stop **26** with the surface **27** of the strip **14** which is oriented toward the hollow chamber **18**. It is advantageous to dispose at least one flexible element **28**, such as, for example a spring **28**, between the surface **27** of the strip **14** and the surface **26** of the roller support head or plate **19**. This is achieved, for example, by the spring **28** either encompassing the rod **17** or being inserted into recesses in the plate **19** and the strip **14**.

The roller support **06** can also be embodied as being one-armed, wherein each rod or tappet **17** is associated with an individual plate **19** that is disposed in the hollow chamber **18**. In this embodiment, two roller supports **06**, each respectively disposed in the guide **16**, cooperate to support the roller **03**. The plate **19**, rod **17**, and legs **21** can also be embodied of one piece with one another, wherein the roller support **06**, at the end protruding into the hollow chamber **18**, i.e. the head **19**, advantageously has an enlarged cross section or at least a stop **26**, and at least on an end protruding from the strip **14**, such as the foot **21**, has a bearing bushing **23**.

The head **19** of the roller support **06** can also be embodied as a plate **19**, which extends over several rollers **03** and on which the rods **17** and feet **21** for several rollers **03** are disposed.

In each embodiment of the device for pressing a packing against a cylinder, the roller supports **06** and rollers **03** are disposed on the strip **14** so that the rollers **03** that are spaced apart from each other in the longitudinal direction are each supported so that they can each rotate around an axis of rotation which is extending approximately parallel to the rotation axis of the cylinder **01** when the device for pressing against the cylinder **01** is pivoted.

The device for pressing a packing **02** against a cylinder **01**, and with a number of first rollers **03**, in accordance with the first preferred embodiment functions as follows. In order to change the printing plate or other packing **02**, the pressing device is pivoted against the cylinder **01** so that the rotational axis of the cylinder **01** and the axle **24** of the roller **03** extend approximately parallel to each other. In this position of the device, the deformable hollow body **04** is acted on by pressure fluid. When the hollow body **04** is acted on by pressure fluid and the resulting reversible shape change to the hollow body **04** occurs, the deformable hollow body **04** is supported against the support surface **07** and presses all of the roller supports **06** resting against the hollow body **04** with their support surfaces **09** simultaneously, counter to the force of the springs **28**, outward, and with the same pressure, against the packing **02**. The rollers **03** and roller supports **06** are now disposed in the deployed position "A", as seen in FIG. **1**. A slight deviation in the position of the device or an inclination of the cylinder **01** is compensated for by the pressure uniformly prevailing over the entire length of the

hollow body **04** by virtue of the fact that rollers **03**, which are spaced further apart from the cylinder **01**, are displaced further out from the hollow chamber **18**. All of the roller supports **06** are pushed out from the hollow chamber **18** until they come into contact with, and exert the same force against the packing **02**. However, the latter only occurs in the tolerance range established by the length of the rod **17** protruding into the hollow chamber **18**.

In another preferred embodiment of the present invention, in addition to the first rollers **03**, which are spaced apart from one another and which are placed against the cylinder **01** in order to install new packings **02** onto it, the device can also have a number of second rollers **29**, which are placed against the packing **02** in order to remove it. This second preferred embodiment of the present invention is depicted in FIG. **2**.

In the second embodiment of FIG. **2**, with a number of first rollers **03** and a number of second rollers **29**, the widened U-shaped frame **08** contains a widened strip **14**, which has a row of second guides **31** in the longitudinal direction of the device, with these second guides **31** being parallel to the row of first guides **16**. The second roller supports **32**, with the second rollers **29**, which are disposed parallel to the first rollers **03**, are supported so that they can slide in these second guides **31**. A second adjusting mechanism **33** such as, for example a second deformable hollow body **33**, is disposed in the hollow chamber **18** between the support surface **07** and the surfaces **34** of the second roller supports **32** and is cooperating with the first deformable hollow body **04**. The first roller supports **06** and the second roller supports **32** can also be actuated by a single deformable hollow body **04** that would be correspondingly embodied and positioned in a manner similar to the first and second deformable bodies **04** and **33**, respectively.

In accordance with the second preferred embodiment, in order to change the packing **02**, first the second rollers **29** are placed against the cylinder **01**. This placement of rollers **29** can be executed by acting on the deformable hollow body **33** with pressure fluid and additionally by pivoting the frame **08** if need be around a pivot axis ending in the longitudinal direction, for example about a shared pivot axis S, so that only the second rollers **29** are disposed in the deployed position A and cooperate with the packing **02**. After the old packing **02** is removed, a new packing **02** is then secured in place. The hollow body **04** is acted on with pressure fluid and the frame **08** is pivoted, if need be, in the opposite direction so that only the first rollers **03** cooperate with the new packing **02** and are disposed in the deployed position A.

If the first roller supports **06** and second roller supports **32** are actuated jointly by pressurization of a single deformable hollow body **04**, then the selection of the rollers **03** or **29** to be activated is executed exclusively by pivoting the frame **08** around the axis extending in the longitudinal direction, for example the pivot axis S. The uniform adjusting force exerted against the cylinder **01** or against a packing **02** on the cylinder **01** for a number of rollers **03** or **29** associated with one deformable hollow body **04** is exerted by acting on the one deformable hollow body **04** with pressure fluid.

In a third preferred embodiment of the present invention, as shown in FIG. **3**, for the arrangement of a number of first rollers **03** and of second rollers **29**, the first rollers **03** and the second rollers **29** are situated approximately diametrically opposite from each other on the frame **08**. In contrast to the device described in conjunction with FIG. **1**, in this third embodiment, the base **13** that borders the hollow chamber **18** is eliminated. Instead of the base **13**, a second strip **36** with second roller supports **32** and the second rollers **29** is provided, which is mirror symmetrical to a plane, the plane of symmetry E**1**, and to the hollow body **04**. The second roller supports **32** have surfaces **34** that cooperate with the hollow body **04** and have a surface **37** that cooperates as a stop **37** with the second strip **36**. The legs **11**; **12** can be elongated, thus assuring the device of being covered at the sides. The device for pressing a packing **02** against a cylinder **01**, as depicted in FIG. **3** can be pivoted by use of a device, which is not specifically shown, in relation to the longitudinally extending pivot axis S, which lies in the plane of symmetry E**1** and which extends parallel to the axles **24** of the first rollers **03** and to the axles **24** of the second rollers **29**. With a diametrical disposition of the rollers **03**; **29**, the shared pivot axis S advantageously coincides with the line of the plane of symmetry E**1** and an intersecting plane E**2** extending through the axles **24** of the first rollers **03** and the second rollers **29**.

In order to change the packing **02** by use of the third preferred embodiment, initially the second rollers **29** are placed against the cylinder **01**. This is accomplished by pivoting the frame **08** around the longitudinally extending pivot axis S and then acting on the deformable hollow body **04** with a pressure fluid so that the second rollers **29** cooperate with the packing **02** and are disposed in the deployed position A. In this connection, the two roller supports **06**; **32** for the rollers **03** and **29**, respectively are pushed apart from each other, for example until the stop **26** of the freely moving roller support **06** cooperates with the first strip **14**. In a manner that corresponds to the support surface **07** from the first preferred embodiment which is depicted in FIG. **1**, the surface **09** of the first roller support **06** cooperates with the hollow body **04** as a support surface **09**. When the deformable hollow body **04** relaxes, the roller support **32** is reset by the spring **28**. After the old packing **02** is removed and the new packing **02** is secured in place, the frame **08** is pivoted, for example by 180°, so that after the deformable hollow body **04** is again acted on with pressure fluid, the first rollers **03** cooperate with the new blanket packing **02** and are disposed in the deployed position A. When the hollow body **04** is again acted on, the stop **37** cooperates with the second guide **36** and the surface **34** cooperates as a support surface **34** with the deformable hollow body **04**.

The first roller supports **06** and the second roller supports **32** can also be disposed at other angles a enclosed between the first rollers **03**, the hollow body **04**, and the second rollers **29**, as shown in FIG. **3**. The second and third preferred embodiments, as depicted in FIGS. **2** and **3**, show the two extremes for a number of first rollers **03** and a number of second rollers **29** disposed next to one another in parallel (α=0°) and diametrically opposite one another in relation to the hollow body **04** (α=180°).

The fourth preferred embodiment of the present invention, as shown in FIG. **4**, shows another device for pressing against the packing **02**, in which the stroke produced by the deformation of the deformable hollow body **04** is multiplied into an increased movement of the rollers **03**.

As seen in FIG. **4**, the deformable hollow body **04** and several rollers **03** are disposed, extending longitudinally approximately parallel to the rotation axis of the cylinder **01**, in the frame **08**. The frame **08** is an approximately U-shaped crossbar **08** with a base **13** and legs **11**; **12** disposed opposite each other. In an advantageous embodiment, the leg length of the leg **12** is embodied as longer than the length of the leg **11**. The leg **12** of the U-shaped crossbar **08** can open outward at its outer end.

The deformable hollow body **04** is disposed inside the U-shaped crossbar frame **08**, extending in its longitudinal

direction, between the support surface **07** associated with the base **13**, the legs **11** and **12**, and the upper surfaces **09** of the heads **19** of the roller supports **06** cooperating with the hollow body **04**.

The roller support **06** essentially has the head **19**, which cooperates with the deformable hollow body **04**, and has at least one strut rod, or tappet **17** on which the roller support foot **21** is disposed and that respectively supports the roller **03**. The strut **17** is at least disposed with its head **19** positioned between the legs **11**; **12** in the frame **08**. It is advantageous to provide one roller support **06** for each roller **03**, and with the roller support **06** having two struts **17**, each strut being provided with a foot **21** for supporting the roller **03**.

On its side oriented toward the hollow body **04**, the head **19** of the roller support **06** has the upper surface **09**, as discussed above, and approximately perpendicular to this upper surface **09**, the head **19** has two side surfaces **38**, with which the roller support head **19** of the roller support **06** is supported against the leg **11** and/or **12** of the frame **08**. For example, the head **19** may be embodied as a plate **19**. The side surface **38** can also be the surfaces oriented toward the leg **11**, **12** of several sliding feet **39** or supporting feet **39** that are disposed next to, and which are spaced apart from each other and are disposed on the plate **19**, on the sides oriented toward the legs **11**; **12**. The strut, rod or tappet **17** connects the plate **19**, which is disposed at its first end, to the roller support foot **21** of the roller support **06**, which is disposed at its second end, and which supports the roller **03**. The plate **19** and the two struts **17** can also be embodied as being of one piece with one another.

In contrast to the roller support foot **21**, which is rigidly connected to the strut **17** in the first preferred embodiment, in the fourth preferred embodiment, the foot **21** of the roller support **06** is embodied as a rocker or as a one-armed lever **21**, which is actuated by movement of the strut **17** that functions as a tappet **17**. The lever **21** is supported so that it can rotate around a fulcrum **41** situated at a first end of the lever **21**.

The fulcrum **41** of the lever **21** is disposed on a rotation axis D, which extends approximately perpendicular to the longitudinal direction of the strut **17** and approximately parallel to the axle **24** of the rollers **03** and which is stationary in relation to the frame **08**. For example, this fulcrum **41** is embodied as a linkage comprised of a fork head **42** fastened to the frame leg **12** and a bolt **43** that passes through the fork head **42** and the lever **21**.

At a point that is spaced from the fulcrum **41**, the strut **17** engages the lever **21**. The lever **21** and strut **17** are connected to each other so that they can rotate around an axis which is approximately parallel to the axle **24** of the rollers **03**. This connection is made, for example, by the use of a bolt **44**, which is disposed in aligned bores in the lever **21** and in the strut **17**.

The bearing bushing **23** or a similar mechanism, which is suitable for supporting the roller **03**, is disposed at the second end of the lever **21** opposite from the fulcrum **41**. In an advantageous configuration, two levers **21** can be associated with a single roller support **06** to respectively support one roller **03**. The roller **03** is disposed between the two levers **21** so that its axle **24** extends approximately parallel to the axis of the cylinder **01** when the levers **21** are actuated by movement of the respective strut **17** of the roller support **06**.

The rollers **03** can also be placed against the cylinder **01** by use of two-armed levers and by differently structured or differently positioned linkage elements, wherein when acted on with pressure fluid, the deformable hollow body **04** actuates a drive element through its reversible deformation, and the stroke of the resulting linear movement on the drive element is translated, possibly by a corresponding coupling, into a movement of the rollers **03**. It is advantageous to provide a transmission or a linkage, which multiplies the stroke of the linear movement generated in the push rod or tappet **17**, during deformation of the hollow body **04**, into a greater movement of the rollers **03**.

The resetting of the rollers **03** or of the roller support **06** is advantageously produced by a spring force. For example, a spring **28** acting on the lever **21** can be fastened to the frame **08** or the strut **17**. It is also possible to place a compression spring between the head **19** and a stop that is not shown.

In a preferred configuration of the present invention, when the device is not actuated, the U-shaped profile of the frame **08** is closed by the provision of one or more guards **47** which are disposed next to one another in the longitudinal direction of the frame **08**. Each guard **47** is fastened to the shorter leg **11** of frame **08**, as seen in FIG. **4**, and can pivot in relation to an axis extending in the longitudinal direction of the frame **08**, for example by the use of a hinge **48**, a strap hinge, or articulating joints. The guard **47** is configured so that it completes the frame **08** in the circumference direction on the shorter leg **11** and at the open end of the U-shaped cross section. When the lengths of legs **11** and **12** are the same, the guard **47** only closes off the open end of the U-shaped frame **08**.

On the side oriented toward the inside of the frame **08**, the guard **47** has, for example, a coupler **49**, which is disposed, at a first end, on the guard **47** and at a second end, on the roller support **06**, and preferably on the strut **17**, so that coupler **49** can pivot around an axis approximately parallel to the longitudinal direction of the frame **08**. The pivoting connection of the coupler **49** to the guard **47** is embodied, for example, as a hinge joint with a link plate **51** and a bolt **52**, all as seen in FIG. **4**. The coupler **49** is fastened to the strut **17** for example by the use of a bolt **53**, which is received, in a form-fitting manner, in a bore **54** in the strut **17**. The guard **47** and the coupler **49** are disposed on the frame **08** or on the strut **17** so that when the roller support **06** is in the rest position, i.e. when the strut **17** is not slid toward the opening in the frame **08** by the pressurization of the deformable hollow body **04**, the guard **47** and the U-shaped frame **08** together encompass the rollers **03** and the adjusting mechanism. In other words they completely enclose the roller support **06** and the hollow body **04**.

The guard **47** can also be coupled to the roller support **06** by other linkage arrangements so that it is opened or closed simultaneously during deployment or retraction of the rollers **03** without incurring additional drive or control costs. It is also possible to provide a parallel arrangement of a number of deformable hollow bodies **04** next to each other in the longitudinal direction of the cylinder **01** or one after or beside the other, in the circumference direction of the cylinder **01**, for example in order to actuate first or second rollers **03**; **29** in a manner that corresponds to the apparatus according to the second preferred embodiment, as shown in FIG. **2**. The first and second rollers **03**; **29** can also be disposed next to one another, for example in alternating fashion, in the longitudinal direction of the cylinder **01**, wherein the first rollers **03** cooperate, by the provision of a first roller support **06**, with a first deformable hollow body **04** and the second rollers **29** cooperate by the provision of a second roller support **32**, with a second deformable hollow body **33**.

The pivoting frame **08** described in the fourth preferred embodiment, as shown in FIG. **4**, is preferably disposed so that it is stationary in relation to the cylinder **01**, and is parallel to the cylinder's rotational axis. The frame **08** and the guard **47** can be embodied so that when the guard **47** is in the closed position, there is an extremely short distance d**47**, of preferably between 20 and 25 mm, in an engagement region between the guard **47** and the cylinder **01**. When the device is disposed between two cylinders **01** that touch, for example between a plate cylinder and a rubber blanket cylinder of a printing press, the form of the frame **08** and the guard **47** can be embodied so that the device also functions simultaneously as a guard that prevents objects from being pulled in between the two rotating cylinders **01**. To this end, a maximal distance of d**12**=6 mm and/or d**47**=6 mm should be maintained in the respective outer engagement region between the cylinder **01** and the frame **08** and/or the guard **47**, for example between the free end of the leg **12** and the cylinder **01** or, when the guard **47** is open, between the free end of the guard **47** and the cylinder **01**. It is advantageous to maintain an obtuse angle toward the operational side in the above-mentioned engagement regions between the cylinder **01** and the pressing device. This can occur by correspondingly configuring the frame **08** and guard **47** or by also providing sheet metal strips, for example.

In a preferred embodiment of the present invention, as is also shown in FIG. **4**, a stop **56** is disposed at the end of the leg **12** and is oriented toward the cylinder **01** in order to facilitate an even, guided placement of the printing plate **02** to be installed on the cylinder **01**. The stop **56** can be of one piece construction. Preferably, several stops **56** are provided on the frame **08**, which several stops **56** are disposed next to each other and which are spaced apart from one another in the longitudinal direction of the frame **08**. They are attached to the frame **08** by use of positive and/or frictional engagement devices, for example by the use of screws **57** at a curved lower end of the leg **12**. However, the stops **56** can also be part of the leg **12**. If the stops **56** are attached to the leg **12** by screws **57**, it is advantageous for the stops **56** to be adjustable in relation to the position of the cylinder **01**, for example by embodying bores **58** in the leg **12** and through which the screws pass as oblong holes.

On a side **59** of stop **56**, which side **59** is oriented toward the cylinder **01** and which cooperates with a leading end **62** of the printing plate **02**, the form and position of the stop **56** are embodied in such a way that a distance d**56** between the side **59** of the stop **56** and the surface of the cylinder **01** tapers in the circumference direction of the cylinder **01**. For example, the side **59** can be embodied of two pieces and so that it is angled in relation to a line **61** extending parallel to the rotation axis of the cylinder **01**, wherein the first section of the side **59** disposed in the insertion region of the leading end **62** of the printing plate **02** is inclined less sharply in relation to the cylinder **01** and the subsequent second section is inclined more sharply in relation to the cylinder **01**. The distance d**56** between the cylinder **01** and the stop **56** should, on the line **61** of the bend **61** or at least in the course of the second section of the side **59**, be less than the height d**62** of the bent leading end **62** of the printing plate **02**.

In accordance with the fourth exemplary embodiment of the device for pressing a packing against a cylinder, in accordance with the present invention, the installation of the packing **02** on the cylinder **01** by use of the device of the present invention takes place as follows: The forme cylinder **01** is initially rotated into a position in which a cylinder groove or channel opening **63** that will receive the bent leading end **62** of the packing, such as a printing plate **02**, comes to rest approximately opposite from the stops **56**. With its bent leading end **62**, the printing plate **02** is inserted between the forme cylinder **01** and the pressing device and is positioned against the stops **56**. When the printing plate **02** is inserted or pushed further toward the stops **56**, the bent leading end **62** of the printing plate **02** is prestressed by the form of the stops **56** and automatically snaps into the cylinder channel opening **63**. After the leading end **62** of the printing plate **02** has been clamped in the channel, the deformable hollow body **04** is acted on with pressure fluid. This opens the guard **47** in response to the movement of the strut **17** and simultaneously places several individually movable rollers **03** against the cylinder **01**. If space conditions require, after the leading end **62** of the printing plate **02** is clamped in position and before the opening of the guard **47** and the deployment of the rollers **03**, the cylinder **01** can first be repositioned, either in the production direction or in the opposite direction. The repositioning of the cylinder **01** occurs, in an advantageous fashion, so that the rollers **03** are placed against the packing, such as a printing plate **02** either directly on, or close to the channel opening **63** in the cylinder **01**. After the rollers **03** are deployed, the cylinder **01** is rotated in the production direction until the rollers **03** again come to rest against the channel **63** and now will guide a trailing plate end into the channel opening **63**.

The opening and closing of the locking mechanisms for the leading end **62** of the printing plate or packing **02** and the trailing end of the plate or packing **02** in the channel opening **63** are preferably actuated automatically and are coordinated with the sequence of the above-described procedures of the plate replacement. The removal of the packing **02** from the cylinder **01** essentially occurs in a reverse sequence.

All of the preferred embodiments of the present invention, as set forth above, have the common feature that a single adjusting mechanism **04** or **33** is used to respectively place a number of first rollers **03** and/or a number of second rollers **29**, which are actuated simultaneously and directly, against the cylinder **01**. This is because the adjusting mechanism, in the form of a deformable hollow body **04**, cooperates with the surface **09**; **34** of a roller support **06**; **32**. In all of the preferred embodiments, in the deployed position A, the same force is exerted directly on all of the rollers **03**; **29** over the length of the device.

While preferred embodiments of a method and devices for pressing a packing against a cylinder, in accordance with the present invention, have been set forth fully and completely hereinabove, it will be apparent to one of skill in the art that a number of changes in, for example the overall size of the cylinder, the type of rotary printing press used, and the like could be made without departing from the true spirit and scope of the present invention which is accordingly to be limited only by the appended claims.

What is claimed is:

1. A method for pressing a packing against a cylinder including:

providing at least one roller;

providing an adjusting mechanism for deploying and retracting said roller;

providing an actuatable guard for covering said roller in a direction of the cylinder; and

actuating said guard and said at least one roller using said adjusting mechanism.

2. A device adapted to press a packing against a cylinder comprising:

at least one roller supported for deployment and retraction with respect to the cylinder;

an adjusting mechanism useable to accomplish said deployment and said retraction of said at least one roller; and

an actuatable guard useable to cover said roller in a direction of the cylinder, said actuatable guard being actuated with said roller by said adjusting mechanism.

3. The device of claim **2** further including a stationary pivot axis, said guard being disposed for pivotal movement about said stationary pivot axis.

4. The device of claim **3** wherein said at least one roller has a roller axle of rotation and further wherein said stationary pivot axis is generally parallel to said roller axle of rotation.

5. The device of claim **2** wherein said guard is actuatable directly by said adjusting mechanism.

6. The device of claim **2** further including a linkage system between said guard and said adjusting mechanism.

7. The device of claim **2** further including a roller support, said roller support supporting a plurality of said rollers, said guard being coupled to said roller support.

8. The device of claim **7** further including a coupler, said coupler extending between said guard and said roller support and being connected in a pivotable manner to both guard and said roller support.

9. The device of claim **2** wherein said adjusting mechanism is a reversibly deformable hollow body, said hollow body being adapted to be acted on by a fluid under pressure.

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